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<p>(21) International Application Number: PCT/IT99/00128</p> <p>(22) International Filing Date: 11 May 1999 (11.05.99)</p> <p>(30) Priority Data: PD98A000112 11 May 1998 (11.05.98) IT</p> <p>(71) Applicant (for all designated States except US): FINCANTIERI CANTIERI NAVALI ITALIANI S.P.A. [IT/IT]; Passeggio S. Andrea, 6, I-34123 Trieste (IT).</p> <p>(72) Inventor; and (75) Inventor/Applicant (for US only): VISINI, Silvio [IT/IT]; Passeggio S. Andrea, 6, I-34123 Trieste (IT).</p> <p>(74) Agents: CANTALUPPI, Stefano et al.; Jacobacci &amp; Perani S.p.A., Via Berchet, 9, I-35131 Padova (IT).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. In English translation (filed in Italian).</p>
<p>(54) Title: PROCESS FOR INSTALLING ELECTRIC DISTRIBUTION LINES IN PREFABRICATED ROOMS, SUCH A CABINS</p> <div data-bbox="435 1129 1182 1705" data-label="Image"> </div> <p>(57) Abstract</p> <p>Lengths or cords of electrical cable (5' to 12') are arranged in the walls (W) of the room and connect respective user points (5 to 12) to one side, preferably constituted by the upper edge, of the respective panel (W). The ends of the lengths of cable emerging at this edge are connected to the central point (1 to 3) of the system by means of wiring extending above the room towards points of connection to respective connectors (14) connected to the lengths of cable associated with the wall panels (W).</p>		

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## PROCESS FOR INSTALLING ELECTRIC DISTRIBUTION LINES IN PREFABRICATED ROOMS, SUCH A CABINS

### Technical field

The present invention addresses the problem of forming  
5 electrical systems in prefabricated rooms such as, for  
example, cabins for ships and barges of various types.

### Technical background

Up to now, the increasing tendency to produce cabins of this  
type in the form of prefabricated blocks (so-called "cabins  
10 in kit form") has involved prefabrication of the cabin walls  
with the provision of ducts or tubing for leading the cables  
of the electrical system from the connection boxes arranged  
in suitable technical compartments to the so-called users  
(sockets, switches, etc.) in order to make the necessary  
15 connections.

Suppliers having the task of producing prefabricated cabins  
consequently provide the panelling of the cabin with the  
above-mentioned tubes. The actual electrical systems are  
formed only in a subsequent step which provides for the  
20 connection boxes to be arranged inside the technical  
compartments and for the cables to be pulled into the  
prearranged tubes and wired to the boxes and to the users.  
These are operations which, in the great majority of cases in  
the shipbuilding field, are usually performed on board, that  
25 is, when the cabins are already installed. This method of  
operation creates considerable problems of coordination and,  
in particular, has a notable effect on the time required to  
fit the cabins themselves.

**Description of the invention**

The object of the present invention is to provide a solution which can prevent the above-mentioned problems so as to reduce production costs considerably.

5 According to the present invention, this object is achieved by means of a method of forming electrical systems in prefabricated rooms such as cabins having the specific characteristics recited in the following claims. The invention also relates to the intermediate product of the  
10 method, that is, to a portion of a prefabricated room or to a prefabricated room as a whole (and hence, with the terminology adopted in the following claims to "at least one wall panel of a prefabricated room") formed with the use of the method according to the invention.

15 Briefly, the solution according to the invention, provides - in the currently-preferred embodiment - for the elimination of all of the cable ducts by the use of three-core cables instead of the single-core cables which are currently in use; three-core cables can be used unprotected and hence without  
20 the need for protective tubes inside the walls of the room.

The supplier of the walls (and possibly of the prefabricated room as a whole), who benefits from the elimination of the tubes, is entrusted with the task of inserting lengths or cords of three-core cable in the walls during the manufacture  
25 of the walls themselves. These lengths of cable connect the peripheral regions of the system (typically the points of use at which the users are to be fitted) to one of the boundaries of the wall. This is preferably one of the vertical limits (and hence in the region of the floor or of the ceiling) and,

even more preferably, the upper boundary of the wall (and hence in the region of the ceiling). The supplier has the further task of connecting the distal ends of the lengths or cords to the users provided in the walls, with cables and  
5 users preferably provided by the same supplier.

The supplier of the electrical portion will therefore prefabricate the boxes to be fitted at the central point of the system (that is, in the so-called technical compartment, of which there is normally one for every two cabins), with  
10 the cables already prewired with lengths long enough to reach the proximal ends of the lengths provided in the walls. The electrical supplier will then provide for the boxes to be fitted and for the cables to be connected to the lengths of cable by simple couplings, by unwinding the hanks.

15 Tests carried out by the Applicant up to now have shown a considerable reduction in assembly operations on board and a reduction in overall costs of the order of as much as 50%.

#### **Brief description of the drawings**

The invention will now be described, purely by way of non-  
20 limiting example with reference to the appended drawings, in which:

Figure 1 is a general perspective view, shown partially transparently, of a cabin of a ship or a barge the electrical system of which is formed in accordance with the invention,

25 Figure 2 shows in greater detail the portion of Figure 1 indicated by the arrow II, and

Figure 3 is another view of the cabin of Figure 1 taken from a slightly different viewpoint.

In the appended drawings, a prefabricated room constituted, in the embodiment shown, by a cabin for a ship such as, for example, a passenger ship, is generally indicated C.

**Preferred embodiment of the invention**

5 According to a solution known *per se*, the cabin C is produced in the form of a prefabricated unit (a so-called kit) manufactured by the interconnection of several panels W which are intended to define the side walls of the cabin, including the partition wall of the portion or room L which houses the  
10 sanitary facilities, one or more base or floor panels P and one or more top or ceiling panels S, possibly formed with a modular structure (for example, in strips).

The general criteria for the production of the above-mentioned wall panels W, P, S (and also with regard to the  
15 provision therein of the doors D1 and D2 for access to the cabin C and to the sanitary facilities L, respectively, as well as the respective methods of connection and assembly) may be considered known *per se* in the art. These criteria do not therefore require a specific description herein, and,  
20 moreover, are not relevant *per se* for an understanding of the invention.

The invention in fact relates primarily to the formation of the electrical system in the cabin C.

In general, this system is intended to connect a central  
25 point of the system to a plurality of user points distributed within the cabin.

The central point of the system comprises, in the embodiment illustrated - which is shown by way of example - a connector box 1 disposed in a respective technical compartment (of

which there is usually one for every two adjacent cabins) usually with the additional provision of a junction box 2 of the telephone system and of a "splitter" of the television system 3 which in fact constitute parts of the electrical system of the cabin C.

The user points are those at which corresponding "users" such as sockets, switches, etc... are installed in respective housing seats.

By way of example, the drawings appended hereto relate to an electrical system comprising the following user points, distributed on the cabin walls:

- a general light switch of the cabin 5,
- a cabin thermostat 6,
- a light switch for the sanitary facilities L,
- 15 - two light points 8, 9 for the beds of the cabin (a bunk arrangement is assumed,
- a television socket 10,
- an electrical energy socket 11,
- a telephone socket 12, and
- 20 - a central light fitting 13.

The list given above is in any case clearly provided purely by way of example and is certainly not limiting of the scope of the invention since account should also be taken of the fact that the solution according to the invention is usually used to serve a good portion of the user points of the electrical system of the cabin C but not necessarily all of the user points; clearly, some of these points such as, for example the cabin thermostat 6 and the central light fitting 13, which are situated on the ceiling C in the vicinity of

the central point 1, 2, 3, may in fact be connected directly thereto.

Basically, the electrical system of the cabin C as a whole can be seen as being formed by two component subunits.

- 5 The first subunit is constituted by a set of lengths (cords) of electrical cable associated with the walls of the room and, in particular - in the embodiment illustrated herein - with the side panels W, so as to connect respective electrical users to one of the side edges, preferably to the  
10 upper edge of the respective panel W. More precisely, each length of cable (which is indicated by the same reference numeral as the respective user followed by an apostrophe) has its distal end connected to the respective user and its proximal end emerging from the panel W.
- 15 The second subunit is constituted by a wiring network which branches from the central point of the system (identified in the embodiment illustrated by the elements 1, 2 and 3) forming the connections with the proximal ends of the lengths of cable (and also with one or more points such as the  
20 thermostat 6 or the central lamp 13 situated in the immediate vicinity).

The lengths in question are preferably produced - when they are cables for transmitting electrical energy - in the form of three-core cables which allows them to be inserted in the  
25 wall panels W without the need for protective ducts (tubing). This latter solution considerably facilitates the production of the walls W and, in particular, the insertion of the lengths of cable therein.



The lengths in question emerge in the region of the upper boundary of each panel W (it should be noted that the selection of the upper edge or boundary is preferred but not essential), with respective connectors 14 some of which are  
5 shown in greater detail in Figure 2. Three connectors are visible for each length of cable in Figure 2 since - in accordance with the preferred solution for the implementation of the invention - the cables are three-core cables. Regardless of the number of connectors 14 present, the  
10 connectors are preferably of the push-fit type which permit a quick and reliable connection to the homologous ends of the set of cables which branch from the central unit 1, 2, 3, usually above the ceiling of the cabin C, optionally and preferably with the provision of protective tubes such as the  
15 tubes generally indicated 4 in the appended drawings.

It will be appreciated from an observation of Figure 2 in particular that there is not necessarily only one length of electrical cable for each user point. There will in fact be as many lengths of cable as there are separate users to be  
20 served; in particular, it can easily be seen, for example, in Figure 1, that, whereas the user box indicated 11 is shown with two associated lengths of cable, generally indicated 11', naturally for serving two respective users, the user region or box 12 is shown as being served by only one length  
25 of cable 12'. Incidentally, it will be noted that, since this cable is generally a telephone cable, it may be constituted simply by a normal telephone loop.

Naturally, the principle of the invention remaining the same, the details of construction may be varied widely with respect

to those described and illustrated, without thereby departing from the scope of the present invention.

**CLAIMS**

1. A method of forming, in prefabricated rooms (C) delimited by a plurality of wall panels (W, P, S), electrical systems for connecting a central point (1, 2, 3) of the system to a plurality of user points (5 to 12) distributed in the room (C), characterized in that it comprises the steps of:
- associating with the wall panels (W, P, S) respective lengths of electrical cable (5' to 12') each of which has a distal end connected to one of the user points (5 to 12) and a proximal end abutting one of the edges of the respective wall panel (W, P, S), and
  - connecting the central point (1, 2, 3) to the proximal ends of the lengths of cable (5' to 12') by means of a further wiring network (4).
2. A method according to Claim 1, characterized in that it comprises the step of associating at least some of the lengths of cable (5' to 12') with the respective wall panels (W) directly, without protective ducts.
3. A method according to Claim 1 or Claim 2, characterized in that it comprises the step of selecting at least some of the lengths of cable (5' to 12') in the form of three-core electrical cables.
4. A method according to any one of the preceding claims, characterized in that it comprises the step of providing the proximal ends of the lengths of cable (5' to 12') and the homologous ends of the further wiring network (4) with push-fit connector elements (14).
5. A method according to any one of the preceding claims, characterized in that it comprises the step of arranging the

proximal ends of the lengths of cable (5' to 12') in the region of the upper edge of the respective wall panel (W).

6. A method according to any one of the preceding claims, characterized in that it comprises the step of providing, at  
5 the user points (5 to 12), respective users of the electrical system already connected to the distal ends of the lengths of cable (5' to 12').

7. An intermediate product of the method according to any one of the preceding claims, the intermediate product comprising  
10 at least one wall panel (W) of a prefabricated room having at least one user point (5 to 12) of the electrical system and bearing at least one associated length of electrical cable having a distal end located in the region of the at least one user point (5 to 12) and a proximal end located in the region  
15 of one of the edges of the wall panel (W).

8. An intermediate product according to Claim 7, characterized in that the at least one length of electrical cable (5' to 12') is associated with the respective wall panel (W) directly without protective ducts.

20 9. An intermediate product according to Claim 7 or Claim 8, characterized in that the length of cable is constituted by a three-core electrical cable.

10. An intermediate product according to any one of Claims 7 to 9, characterized in that the at least one length of  
25 electrical cable (5' to 12') is arranged with its proximal end in the region of the upper edge of the respective wall panel (W).

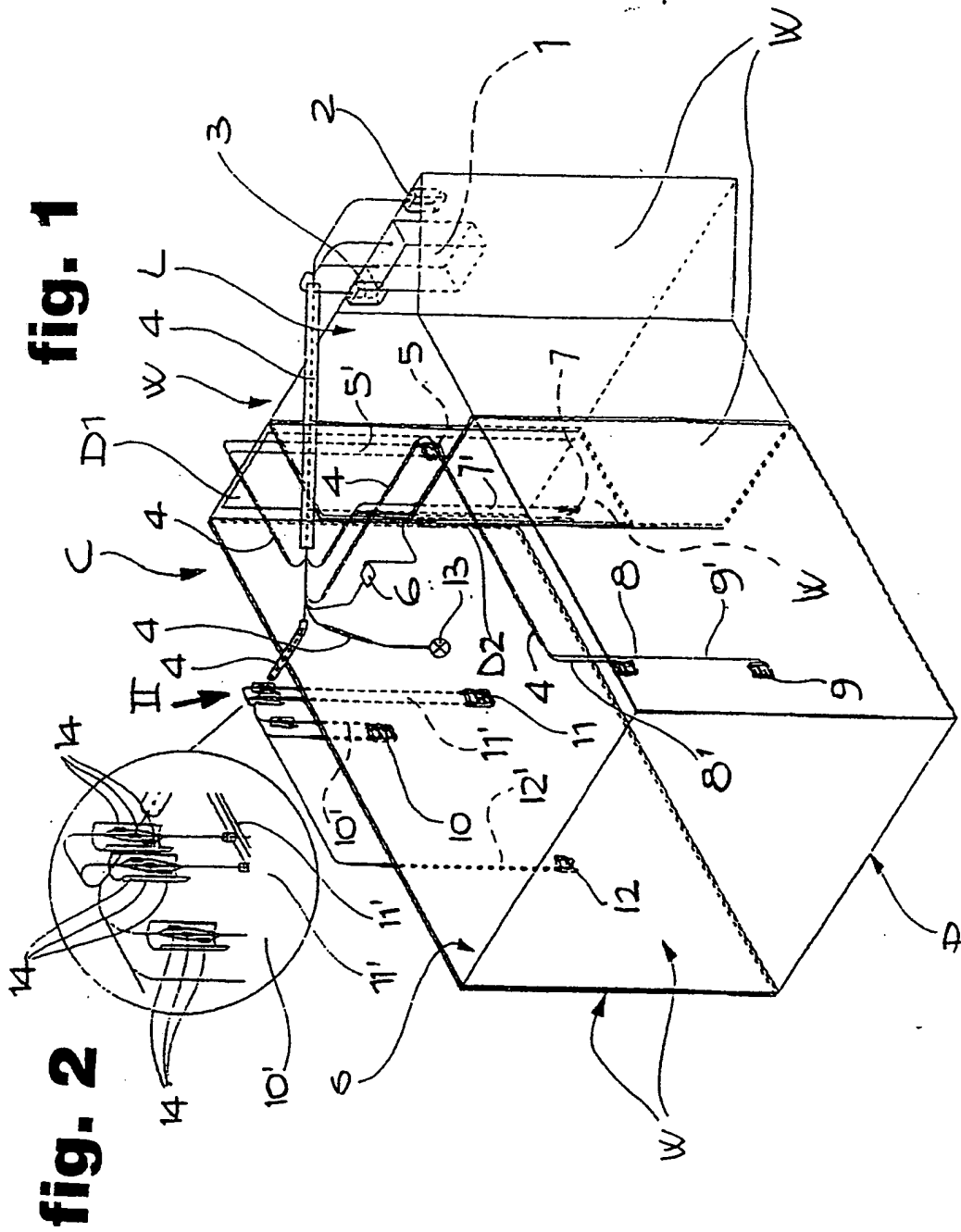
11. An intermediate product according to any one of preceding claims 7 to 10, characterized in that it further comprises at

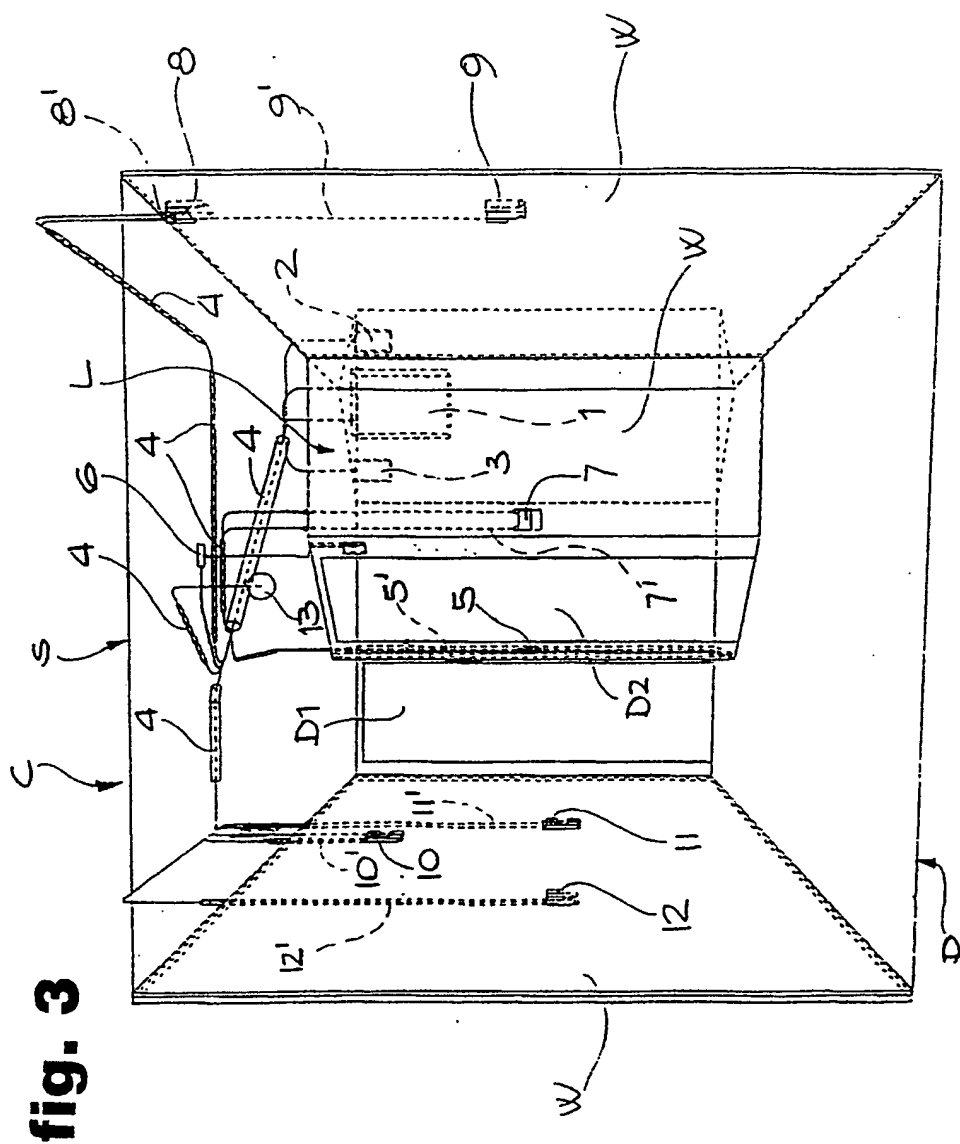
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least one electrical device located at the at least one user point (5 to 12) and connected to the respective length of electrical cable (5' to 12').

12. An intermediate product according to any one of preceding  
5 Claims 7 to 11, characterized in that push-fit electrical connector means (14) are associated with the proximal end of the at least one length of electrical cable (5' to 12').

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# INTERNATIONAL SEARCH REPORT

International Application No

PL/IT 99/00128

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 H02G3/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H02G B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 389 260 A (VIODE SADIER) 24 November 1978 (1978-11-24)	1,2,4-8, 10-12
Y	page 2, line 38 - page 3, line 37; figures 1-4	3,9
Y	page 6, line 36 - line 38 US 5 007 853 A (OLSEN) 16 April 1991 (1991-04-16) column 13, line 32 - line 57; figure 43	3,9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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